

This is a stand-alone document intended to direct ICU/ventilator allocation throughout the state of Utah during the COVID-19 pandemic. It is an update to the 2010 Utah Pandemic Influenza Hospital Triage Guidelines and 2018 Utah Crisis Standards of Care Guidelines, takes into account factors specific to COVID-19, and also provides additional framework for operationalizing these previous plans. This protocol does not discriminate based on race, color, national origin, disability, sex, or exercise of conscience and religion. It only includes age as a tie breaker between otherwise similar patient groups due to predicted differences in outcomes. It meets the CSC ethical goals of fairness, duty to care, transparency, consistency, proportionality, and accountability. We recommend the use of Crisis Triage Officers (CTOs) or CTO Teams be used during contingency and crisis care.

Contingency Care: Every effort should be made to avoid Crisis Standards. CTO's should make frequent assessments of ICU/ventilator supply relative to anticipated patient demand. Contingency strategies should be maximized based on evidence-based best practices as they emerge, and load leveling among hospitals and healthcare systems through coordinated patient and resource allocation.

Crisis Care: If ICU/ventilator capacity still becomes insufficient, the CTO should communicate the situation with Incident Command at the facility, system, and state level. The Governor would then establish Crisis Standards statewide, and additional load leveling should be attempted. ICU/ventilator care needs to be increasingly focused on those that are more likely to benefit from it, to meet the goal of "the greatest good for the greatest number." Additionally, non-ICU care, including comfort care, needs to be made available to those that are critically ill but unlikely to benefit from ICU care. This pivot will be facilitated by end of life discussions with family, and Modified Sequential Organ Failure Assessment (MSOFA) score-based prioritization (table 1); all assisted by the CTO.

For patients considered for ICU/ventilator care when Crisis Standards of Care is established:

Step 1) Engage in a shared decision-making discussion with patient/surrogate, early on and throughout the patient's care, that focuses on obtaining either informed consent or informed assent (in which the family is explicitly offered the choice to defer to clinicians' judgment) for withholding or withdrawing life-sustaining therapy. Provide information about the risks and benefits of potentially prolonged ICU/ventilator care with its attendant risks of discomfort and uncertain prospects for recovery, and convey specific recommendations about the medically proposed course. Attempt to obtain any POLST or other advance directive documentation, through the EMR or by contacting the sending care center, if guidance from the patient/surrogate is not available. If indicated by documentation or if the patient/surrogate declines ICU care, arrange for non-ICU care.

Non-ICU Care Criteria: Patients with the following conditions should be offered non-ICU care:

- a) DNR or similar POLST or advance directive
- b) Severe and irreversible acute or chronic neurologic condition.
- c) Severe acute trauma with a REVISED TRAUMA SCORE <2.
- d) Severe burns with <50% anticipated survival.
- e) Cardiac arrest without easily identifiable AND reversible cause.
- f) Incurable, advanced metastatic cancer, causing organ dysfunction.
- g) MSOFA greater than 11, as initial cutoff.
- h) MSOFA greater than the Crisis MSOFA Cutoff determined in Step 3.

MSOFA does not apply to patients less than age 14. For pediatrics, clinicians should use the non-ICU care criteria, and best clinical judgement. The predictive ability of MSOFA has not been studied in COVID-19 and we anticipate revising this guideline as data emerges which could enhance the prediction of survivability with COVID-19. In addition, conditions may be added, removed, or adjusted on the basis of new evidence or evolution of the crisis.

Provide critical care stabilization if ICU/ventilator care is in the patient's best interest after shared decision making, non-ICU criteria are not present, and resources are available. Inform the patient/surrogate of the potential need to evaluate the appropriateness of ICU/ventilator care support going forward, including the need for surrogates to be readily available for discussion and decision making.

Step 2) Patients in whom ICU/ventilator care is not proving beneficial (MSOFA > 11, or MSOFA 8 to 11 AND increasing trend) should be transitioned to non-ICU care. The goal is to **“stay ahead by at least one ventilator,”** such that there is a readily available ICU/ventilator whenever possible.

Step 3) If additional ICU/ventilator needs are still identified or projected, **additional ICU/ventilator withdrawal** will be needed to achieve the goal of having some ICU/ventilators available. This should be made based on MSOFA score calculations for all patients on ICU/ventilator care for at least 48 hours and then at least every 24 hours. First, patients with MSOFA > 11, or MSOFA 8 to 11 AND increasing trend need to be considered for transition to non-ICU care. If additional ICU/ventilator care is needed, the patients with the highest MSOFA or those with worsening MSOFA score trends should be considered for transition to non-ICU care to meet the ongoing ICU/ventilator demand. This **Crisis MSOFA Cutoff** for ongoing ICU/ventilator care needed to create enough capacity for new ICU/ventilator demand should be communicated to Incident Command at the facility, system, and state level, to allow for ongoing resource sharing and load leveling primarily via patient admission adjustments as a means to make this Crisis MSOFA Cutoff as even as possible across the state.

Some patients with MSOFA scores above the Crisis MSOFA Cutoff should be considered for continued ICU/ventilator care, unless their clinical condition or shared decision-making process indicates otherwise. These include the following:

Pregnancy: Patients with pregnancy may represent two lives, and thus giving them priority is aligned with “do the greatest good for the greatest number.”

Those who are younger generally have better outcomes. Solely because of its predicted impact on outcomes, age should be used as a tie-breaker when not all patients with similar MSOFAs can get ICU/ventilator care.

Those who are central to the public health response in order to preserve this vital workforce. Those whose work directly supports the provision of acute care to others are vital to the public health response, and thus should be prioritized for ICU/ventilator care.

As currently written, this protocol tries to keep ICU/ventilator care available for new patients that may benefit from it, by withdrawing ICU/ventilator care from those not benefiting from it. If the crisis deepens and we learn that patients need more time on ICU/ventilator care to survive, this “stay ahead by at least one vent” strategy may need to be abandoned in order to achieve the primary goal of “do the greatest good for the greatest number.”

Step 4) We can expect that the degree of crisis will wax and wane. **By making daily determinations of ICU/ventilator demand compared with supply, the CTO should adjust the Crisis MSOFA Cutoff as needed,** and should communicate it at least daily to critical care providers and facility, system, and state Incident Command for ongoing load leveling. The CTO will also address appeals from either families or

critical care providers. As the crisis wanes, the Crisis MSOFA Cutoff will rise and eventually will not be needed to maintain adequate ICU/ventilator capacity. This should be communicated to the state. **Crisis Standards should be lifted when all hospitals have been load leveled out of using a Crisis MSOFA Cutoff**, as the state returns to contingency care and eventually conventional care.

Table 1: Modified Sequential Organ Failure Assessment (MSOFA)

Variable	Score 0	Score 1	Score 2	Score 3	Score 4	Row Score
SpO ₂ /FIO ₂ ratio* or nasal cannula or mask O ₂ required to keep Spo ₂ >90%	SpO ₂ /FIO ₂ >400 or room air Spo ₂ >90%	SpO ₂ /FIO ₂ 316-400 or Spo ₂ >90% at 1-3 L/min	SpO ₂ /FIO ₂ 231-315 or Spo ₂ >90% at 4-6 L/min	SpO ₂ /FIO ₂ 151-230 or Spo ₂ >90% at 7-10 L/min	SpO ₂ /FIO ₂ ≤150 or Spo ₂ >90% at >10 L/min	
Jaundice	no scleral icterus			jaundice/ scleral icterus		
Hypotension†	None	MABP <70	dop <5	dop 5-15 or epi ≤0.1 or norepi ≤0.1	dop >15 or epi >0.1 or norepi >0.1	
Glasgow Coma Score	15	13 -14	10 to 12	6 to 9	<6	
Creatinine level, mg/dL	<1.2	1.2 - 1.9	2.0 - 3.4	3.5-4.9 or urine output <500 mL in 24 hours	>5 or urine output <200 mL in 24 hours	
MSOFA score			Total score from all rows =			

SpO₂/FIO₂ ratio: SpO₂ = Percent saturation of hemoglobin with oxygen as measured by a pulse oximeter and expressed as % (e.g., 95%); FIO₂ = Fraction of inspired oxygen; e.g., ambient air is 0.21 Example: if SpO₂=95% and FIO₂=0.21, the SpO₂/FIO₂ ratio is calculated as 95/0.21=452
MABP = mean arterial blood pressure in mm Hg (diastolic + 1/3(systolic - diastolic))

Dop = dopamine in mcg/kg/min / epi = epinephrine in mcg/kg/min / norepi = norepinephrine in mcg/kg/min

